

REMARKS

The Official Action dated August 5, 2003 has been carefully considered. Accordingly, the changes presented herewith, taken with the following remarks, are believed sufficient to place the present application in condition for allowance. Reconsideration is respectfully requested.

By the present Amendment, claims 1-28 have been cancelled and claims 29-56 are presented. Claim 29 contains limitations from previous claims 1, 3 and 12, while claims 30 and 31 contain limitations from previous claims 13 and 14, respectively. Claim 32 contains limitations from previous claims 1, 12 and 15, while claims 33-41 contain limitations from previous claims 16-21 and 24-26, respectively. Claims 42-46 also contain limitations from previous claims 20, 21 and 24-26, respectively. Claims 47-53 contain limitations from previous claim 27, while claims 54-56 contain limitations from previous claim 28. It is believed that these changes do not involve any introduction of new matter, whereby entry is believed to be in order and is respectfully requested.

In the Official Action, the abstract was objected to as not being printed on a separate page. Included in the Amendments to the Specification presented herewith is an abstract on a separate sheet. It is believed that this overcomes the objection to the disclosure. Reconsideration is respectfully requested.

Claims 1-28 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The Examiner asserted various terms and phrases in claims 1, 4, 5, 7, 9, 11, 12, 15, 20, 21, 25, 26 and 28 as being indefinite.

This rejection is traversed with respect to claims 29-56 presented herein. The Examiner's comments were carefully reviewed, and it is believed that the present claims are definite to one of ordinary skill in the art and address the concerns raised by the Examiner in

the rejection. It is therefore submitted that the rejection under 35 U.S.C. §112, second paragraph, has been overcome. Reconsideration is respectfully requested.

Claims 1, 20, 22 and 24 were rejected under 35 U.S.C. §102(b) as being anticipated by the Fabrizio et al U.S. Patent No. 4,536,265. The Examiner asserted that Fabrizio et al disclose siloxane polyphotoinitiators as claimed.

However, Applicants submit that the claimed macromolecular photocrosslinkers, and the methods and compositions employing the claimed macromolecular photocrosslinkers, as defined in claims 28-56 are not anticipated by Fabrizio et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

More particularly, the macromolecular photocrosslinkers according to the invention are defined by independent claims 29 and 32. According to claim 29, the macromolecular photocrosslinker has the general formula $(A)_n(B)_m(C)_p$ wherein (i) units A, B and C are siloxane monomer units of the general formula $-R_aR_bSiO-$, wherein R_a and R_b in units A and B are lower substituted or unsubstituted alkyl groups, aryl groups or arylalkyl groups; (ii) C carries a photoactive acyl or aroyl phosphine oxide group; and (iii) $n = 0-98$ mole %, $m = 0-98$ mole %, $n + m = 50-98$ mole % and $p = 0.5-50$ mole %. The photoactive groups, when exposed to light of wavelength above 305 nm, are adapted to generate radicals which are retained on the macromolecular photocrosslinker and react to form a crosslinked network structure.

According to claim 32, the macromolecular photocrosslinker has the general formula $(A)_n(B)_m(C)_p$ wherein (i) A is $-Si(R^1R^2)-O-$, B is $-Si(R^1R^3)-O-$ and C is $-Si-(R^1R^4)-O-$, wherein R^1 is C_1 to C_6 alkyl; R^2 is C_1 to C_6 alkyl or phenyl; R^3 is R^1 , R^2 or C_1 to C_6 fluoroalkyl; R^4 is $-R^5R^6C(O)P(O)R^7R^8$ or $-R^5R^6P(O)R^7OC(O)R^8$, wherein R^5 is a spacing group; and R^6 , R^7 and R^8 are the same or different aryl groups and comprise phenyl, methylphenyl,

dimethylphenyl, trimethylphenyl, methoxyphenyl, dimethoxyphenyl, trimethoxyphenyl, methylolphenyl, dimethylolphenyl, trimethylolphenyl or styryl radicals; (ii) C carries photoactive groups; and (iii) $n = 0-98$ mole %, $m = 0-98$ mole %, $n + m = 50-98$ mole % and $p = 0.5-50$ mole %. The photoactive groups, when exposed to light of wavelength above 305 nm, are adapted to generate radicals which are retained on the macromolecular photocrosslinker and react to form a crosslinked network structure.

Fabrizio et al disclose an organopolysiloxane photoinitiator having an average of at least two siloxane units, of which at least an average of one siloxane unit per organopolysiloxane molecule has a substituted acetophenone photomoiety. However, Applicants find no teaching or suggestion by Fabrizio et al of photocrosslinkers as defined in claim 29, particularly having a siloxane unit carrying a photoactive acyl or aroyl phosphine oxide group, or as defined in claim 32, particularly having a unit C of the formula $-\text{Si}-(\text{R}^1\text{R}^4)-\text{O}-$, wherein R^4 is $-\text{R}^5\text{R}^6\text{C}(\text{O})\text{P}(\text{O})\text{R}^7\text{R}^8$ or $-\text{R}^5\text{R}^6\text{P}(\text{O})\text{R}^7\text{OC}(\text{O})\text{R}^8$.

Anticipation under 35 U.S.C. §102 requires that each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference, *In re Robertson*, 49 U.S.P.Q.2d 1949, 1950 (Fed Cir. 1999). In view of the failure of Fabrizio et al to teach photocrosslinkers of the formula set forth in claim 29 or of the formula set forth in claim 32, Fabrizio et al do not disclose each and every element of these claims, or any of claims 30, 31 and 33-56 dependent thereon. Thus, Fabrizio et al do not anticipate the present claims under 35 U.S.C. §102. It is therefore submitted that the rejection under 35 U.S.C. §102 based on Fabrizio et al has been overcome, and reconsideration is respectfully requested.

Claims 1-6, 20 and 21 were rejected under 35 U.S.C. §102(b) as being anticipated by the Angiolini et al publication entitled "Polymeric Photoinitiators Bearing Side-Chain

Benzoyl Diphenylphosphineoxide Moieties for UV Curable Coatings." The Examiner asserted that Angiolini et al disclose polymeric photoinitiators wherein the polymeric units are substituted ethylene units and the photoactive group is an acyl phosphine oxide group.

However, Applicants submit that the macromolecular photocrosslinkers and the compositions and methods employing macromolecular photocrosslinkers according to claims 29-56 are not anticipated by Angiolini et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

The macromolecular photocrosslinkers defined by independent claims 29 and 32 are discussed in detail above. Angiolini et al disclose polymeric photoinitiators bearing side-chain benzoyl diphenylphosphineoxide moieties which are prepared by reacting poly(4-vinylbenzoic acid) or 4-vinylbenzoic acid/methyl methacrylate copolymers with thionyl chloride followed by methoxy diphenylphosphine. However, Applicants find no teaching or suggestion by Angiolini et al of macromolecular photocrosslinkers having siloxane monomer units, particularly of the formula required by claim 29 or of the formula required by claim 32. Thus, Angiolini et al do not disclose each and every element of the present claims and therefore do not anticipate claim 29 or claim 32, or any of the claims dependent thereon. It is therefore submitted that the rejection under 35 U.S.C. §102 based on Angiolini et al has been overcome. Reconsideration is respectfully requested.

Claims 1, 5-14, 20, 21 and 25 were rejected under 35 U.S.C. §102(e) as being anticipated by the Chabreck et al U.S. Patent No. 6,087,412. The Examiner asserted that Chabreck et al disclose oligomeric photoinitiators and polymers comprising photoinitiator moieties provided by copolymerizing the oligomeric photoinitiators. The Examiner further asserted that Chabreck et al disclose that the polymers are a useful biomedical material and that siloxane and vinyl oligomers or polymers are taught.

However, Applicants submit that the macromolecular photocrosslinkers, and the methods and compositions employing the same, as defined by claims 29-56 are not anticipated by Chabracek et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

The macromolecular photocrosslinkers defined by claims 29 and 32 are discussed in detail above. Chabracek et al disclose crosslinked polymers which are polymerization products of a polymerizable mixture that comprises a macromer of defined formula, a copolymerizable vinyl monomer, and a copolymerizable crosslinker. The macromer includes a photoinitiator moiety. Suitable photoinitiator moieties are described at column 9, line 54 - column 16, line 20. However, Applicants find no teaching or suggestion by Chabracek et al relating to a macromolecular photocrosslinker including a photoactive acyl or aroyl phosphine oxide group as required by claim 29 or a macromolecular photocrosslinker having C units of the formula $-\text{Si}-(\text{R}^1\text{R}^4)-\text{O}-$, wherein R^4 is $-\text{R}^5\text{R}^6\text{C}(\text{O})\text{P}(\text{O})\text{R}^7\text{R}^8$ or $-\text{R}^5\text{R}^6\text{P}(\text{O})\text{R}^7\text{OC}(\text{O})\text{R}^8$ as required by claim 32. In view of the failure of Chabracek et al teach such macromolecular photocrosslinkers, Chabracek et al do not disclose each and every element of the claims under consideration and therefore do not anticipate claims 29 and 32, or any of claims 30, 31 and 33-56 dependent thereon, under 35 U.S.C. §102. It is therefore submitted that the rejection under 35 U.S.C. §102 based on Chabracek et al has been overcome. Reconsideration is respectfully requested.

Finally, claims 1-28 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-23 of the Hodd et al U.S. Patent No. 6,589,550. The Examiner asserted that although the conflicting claims are not identical, they are not patentably distinct from each other because the components of the aqueous solution set forth in the claims of the cited Hodd et al patent include a

macromolecular material having functional vinylic or (meth)acrylic groups and a photoinitiator comprising photoactive groups attached to linear polymers corresponding to the polymer provided with vinylic or (meth)acrylic groups in the composition recited in the present claims.

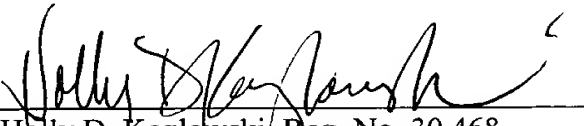
However, Applicants submit that the macromolecular photocrosslinkers defined by claims 29 and 32, and the macromolecular photocrosslinkers, methods and compositions defined by claims 30, 31 and 33-56 are patentably distinct from the claims of Hodd et al. Accordingly, this rejection under the judicially created doctrine of obviousness-type double patenting is traversed and reconsideration is respectfully requested.

The macromolecular photocrosslinkers defined by independent claims 29 and 32 are discussed in detail above. As previously discussed, these macromolecular photocrosslinkers comprise siloxane monomer units. The remaining claims 30, 31 and 33-56 are directed to further limitations of the macromolecular photocrosslinkers, or to methods or compositions containing such macromolecular photocrosslinkers.

On the other hand, the Hodd et al patent claims are directed to ophthalmically acceptable aqueous solutions and kits for preparing such solutions. While the solutions comprise water soluble macromolecular particles and a water soluble photoinitiator capable of crosslinking the particles, Applicants find no disclosure in the Hodd et al claims of macromolecular photocrosslinkers having siloxane units as required by claims 29 and 32. Thus, the present claims 29-56 are nonobvious over and patentably distinguishable from the claims of Hodd et al, whereby the rejection under the judicially created doctrine of obviousness-type double patenting has been overcome. Reconsideration is respectfully requested.

It is believed that the above represents a complete response to the objection and to the rejections under 35 U.S.C. §§ 102 and 112, second paragraph, and under the judicially created doctrine of obviousness-type double patenting, and places the present application in condition for allowance. Reconsideration and an early allowance are requested.

Respectfully submitted,

By 
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